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**TITLE: EXPERIMENT SHOWING A MECHANICAL MANIFESTATION OF THE HELICITY  
OF TRANSPORT CURRENT IN SUPERCONDUCTING WIRES**

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**EXPERIMENT SHOWING A MECHANICAL MANIFESTATION OF THE HELICITY OF TRANSPORT CURRENT  
IN SUPERCONDUCTING WIRES\***

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The transport current density of the mixed state of type II agrees with the form  $\mathbf{g}_1 \mathbf{g}_2 \mathbf{j}_2 + \mathbf{g}_3 \mathbf{j}_3$ , when the supercurrent exhibits a helical distribution due to the application of an external field  $B_{\perp}$ . This is proved by the magnetic moment measurements of Veltman and Tamm, who observed the so-called "paramagnetic" component of moment  $M$  when  $j_3 \neq 0$ . We have observed a much simpler distribution of the helical current by comparing the microwave propagation experiment with a modified technique for measuring the band structure of the sample. Moreover, we observed the tor for even when  $B_{\perp}$  is in effect, that might be explained by the theory of Banks and Wilson or the self-energy effect of transport currents in normal metals due to spin-orbit interactions.

#### 1. 國際化之問題

Watson and Lee [3] studied the response of a square lattice to impact by a type II copper cylinder of diameter  $D$ , which was impacted at an initial velocity  $V_0$ . The critical impact velocity to generate plastic yielding in the cylinder was calculated by solving the equation of motion with boundary conditions at the cylinder ends [3]. The critical impact velocity was found to be proportional to  $D^{1/2}$  and to be independent of the lattice constant. The critical impact velocity  $V_c$  was then plotted to be proportional to the product of the planting force  $F_c$  and the penetrator into the hexagonal lattice. Accordingly, the impact velocity  $V_c$  (penetration depth) of the penetrator in the form  $V_c = \frac{1}{2} \sqrt{\frac{F_c}{\rho}} D^{1/2}$  with the local yield strength  $\sigma_y$  given by  $\sigma_y = \frac{1}{2} F_c D^{-1/2}$  was derived. In the resulting response of the impact of the cylinder three energy transfer mechanisms were identified. The first question concerned whether the total energy exchange with a cylinder, even when  $R = 0$ ,

The purpose of the present work is to determine the field-effect of the current effect that can exist in low- $\lambda$  type II superconductors in the absence of later external field. This has been used in the above work. Other, the effect in this case is expected to be much more effective especially around some propagation component of the conduction set. A detailed discussion is given in the following section below.

#### 11. PREVIEW OF THE FUTURE

As shown in Figure 1, current flows through the superconducting wire sample and is applied to the upper and lower electrodes. By the heat effect, squeeze of the film and the heating of the heat sink plate, the probe is cooled down to liquid nitrogen temperature. The part of the probe between the probe tip and the base of the probe is at the same temperature as the liquid nitrogen. The current flowing through the sample is measured by the current meter shown in the figure.

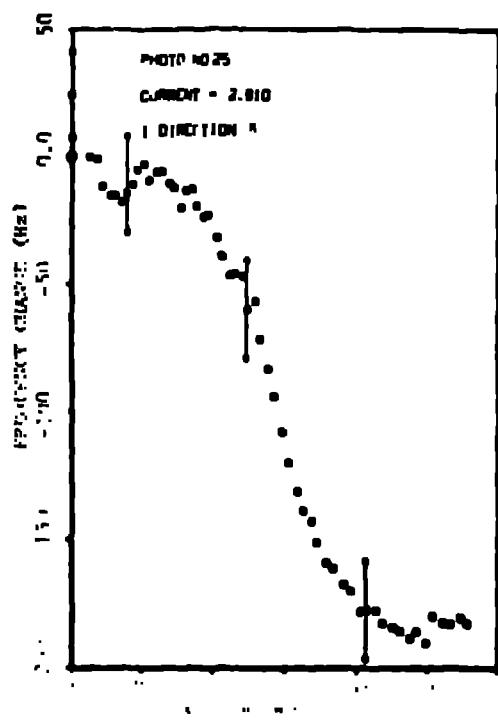
### **• What is a 'right' or 'privilege'?**



#### **Figure 5. Results of the experiments.**

On April 10, 1943, the first group of 100 men  
of the 442nd Regimental Combat Team left  
for Italy. The 442nd was the first unit of the  
U.S. military to be composed entirely of Japanese  
Americans. It was the only unit in the U.S.  
military to receive three Presidential Unit Citations.

For the first time in the history of the country, the people of the United States have been compelled to make a choice between two political parties, each of which has a distinct and well-defined platform, and each of which has a definite and well-defined object in view. The people of the United States have been compelled to make a choice between two political parties, each of which has a distinct and well-defined platform, and each of which has a definite and well-defined object in view.

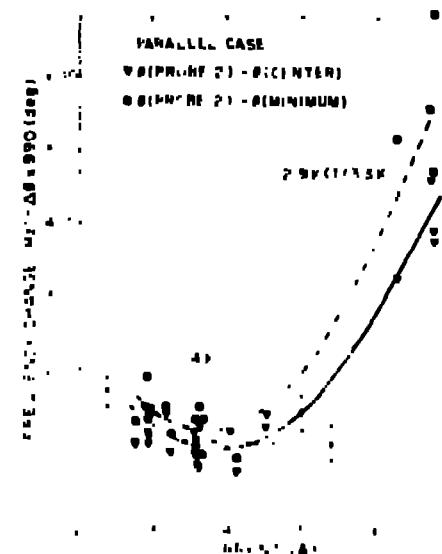


### Figure 5. Frequency distribution of the items

of the electron current in the same direction as the primary wave. The effect of the parallel velocity on the current density is the same as that on the current in the direction of the primary wave. The effect of the parallel velocity on the current density is the same as that on the current in the direction of the primary wave. The effect of the parallel velocity on the current density is the same as that on the current in the direction of the primary wave. The effect of the parallel velocity on the current density is the same as that on the current in the direction of the primary wave.

**Figure 2.** Two examples of some examples of the raw experimental data for the sample 1, i.e. the effect of the beginning of aging and formation of the new interface versus the frequency change due to the end of the cycle from the 1st to the 2nd half cycle. The amplitude of the wave is denoted by the height of the dots, the interface between the initial Pomerly state and the final one is denoted by the dashed line. The vertical axis is the angle of rotation in degrees, i.e.  $\Delta\varphi = 90^\circ$ .

**Figure 1.** Low Frequency (from 0.01 to 10 Hz) Difference between sets of data for the parallel axis on the temperature range 27.0 to 30.0°C. Each data set for the three thermal models after the absolute difference between the responses of the two methods for each value of the temperature was obtained. The difference between the values obtained for the two methods at the center of the film at the parallel axis



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and the other two are given in the following table. The data for the first model were obtained from the literature, while the second set of data was obtained by fitting the model to the observed data. The third set of data is the one used in the present study. The last two sets of data are taken from the literature.

and Kondo [4] studied the problem of the effect of the current in the central solenoid on the magnetic field distribution in the different parts of the cylinder. They concluded that the effect of the current in the central solenoid is small. The location at which would come the main expanding direction of the magnetic field in the air gap which probably would be just before the last coil. This would cause a large leakage field. In our experiment, which is not intended to investigate the coupling effect between currents in the two coils, we would have to take a counter-current. The direction of the magnetic force in a counter-current mode is not identical with that of the direct one, as simple calculations show. A pair of Hall probes must be connected so that their current could be "shared" between them. The result of the experiments is shown in Fig. 11. The left current source shows 0.1 A, while

Finally, one should be able to read the results of extensive surveys and questionnaires in terms of the structure of the population, and the latter can be done by the methods described in the section on factor analysis, and the observed differences between the two methods of measurement.

- (1) *Mathematical and Theoretical Biology*,  
Editor-in-Chief: Thomas Hillen, University of Alberta  
(2) *Computational Biology*, Editor: Lyle A. Groves